

8 an epitaxial layer formed on [a silicon] the substrate[,
9 wherein said first vertical type bipolar transistor has] above
10 the datum surface and having an epitaxial impurity
11 concentration and an epitaxial conductive type;

12 a first embedded diffusion layer formed as part of a
13 first vertical type bipolar transistor in [an] a first upper
14 part of [said silicon] the substrate;

15 [and having an impurity concentration higher than that of
16 said epitaxial layer, said second vertical type bipolar
17 transistor having]

18 a second embedded diffusion layer formed as part of a
19 second vertical type bipolar transistor in [an] a second upper
20 part of [said silicon] the substrate,

21 [and of the same conductive type as said epitaxial
22 layer,]

23 wherein the second embedded diffusion layer includes an
24 impurity concentration [of said second embedded diffusion
25 layer] that is less than the impurity concentration of [said]
26 the first embedded diffusion layer, and

27 [and is approximately equal to or higher than the
28 impurity concentration of said epitaxial layer; wherein the
29 depth of said second embedded diffusion layer is deeper than
30 that of said first embedded diffusion layer, and]

31 wherein a peak position of an impurity concentration of
32 the first embedded diffusion layer resides at a first distance
33 from the datum surface of the substrate and a peak position of
34 an impurity concentration of the second embedded diffusion
35 layer resides at a second distance from the datum surface of
36 the substrate such that the first distance is greater than the
37 second distance.

38 [a region formed between said silicon substrate and a base
39 region of said second vertical type bipolar transistor is
40 deeper than that of a region formed between said silicon
41 substrate and a base region of said first vertical bipolar
42 transistor.]

Subt H 2 3. (Amended Two Times) A semiconductor device according
2 to claim 1,

3 wherein the first embedded diffusion layer is formed at a
4 third distance from the datum surface of the substrate,
5 wherein the second embedded diffusion layer is formed at
6 a fourth distance from the datum surface of the substrate such
7 that the fourth distance is less than the third distance.

8 [a depth of said first embedded diffusion layer is
9 shallower than a depth of said second embedded diffusion
10 layer.]

1 4. (Amended Two Times) A semiconductor device according
2 to claim 1, wherein the impurity concentration of [said] the
3 second embedded diffusion layer is at least [as great as]
4 equal to the impurity concentration of [said] that portion of
5 the epitaxial layer formed above [said] the second embedded
6 diffusion layer.

Subt 3 6. (Amended Two Times) A semiconductor device according to
2 claim 1, wherein the substrate is a single substrate, wherein
3 the datum surface is a bottom surface of the substrate, and
4 wherein the impurity concentration of [said] the second
5 embedded diffusion layer is 1×10^{13} to 1×10^{15} .

G4 1 17. (Amended Two Times) A semiconductor device according
2 to claim 1, further comprising:

3 a third embedded diffusion layer having a conductive type
4 that is the opposite of the epitaxial conductive type; and
5 [a third vertical type bipolar transistor having]
6 a separating diffusion layer formed in [an] a third upper
7 part of [said silicon] the substrate [for separating from said
8 silicon] to separate from the substrate [a] the third embedded
9 diffusion layer [having an opposite conductive type to that of
10 said epitaxial layer].

1 19. (Amended One Time) A semiconductor device according
2 to claim 1, wherein [said] the epitaxial layer is an effective
3 collector layer.

1 20. (Amended One Time) A semiconductor device according
2 to claim 1, wherein [said] the second embedded diffusion layer
3 is an effective collector layer.

Subt H 4 21. (New) A semiconductor device according to claim 1,
1 wherein the impurity concentration of the second embedded
2 diffusion layer is approximately equal to or higher than the
3 epitaxial impurity concentration at all distances from the
4 datum surface of the substrate beyond the peak position of the
5 impurity concentration of the second embedded diffusion layer.

Subt H 4 22. (New) A semiconductor device according to claim 1,
1 wherein a peak position of an impurity concentration of the
2 second embedded diffusion layer resides at a distance from the
3 datum surface of the substrate that is approximately equal to
4 a location of the bottom of the first embedded diffusion layer
5 from the datum surface of the substrate.

1 23. (New) A semiconductor device according to claim 1,
2 wherein the first vertical type bipolar transistor defines a
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3 voltage that is different than the a second vertical type
4 bipolar transistor,
5 wherein the substrate is a silicon substrate,
6 wherein the first embedded diffusion layer includes an
7 impurity concentration that is higher than the epitaxial
8 impurity concentration, and
9 wherein the second embedded diffusion layer defines a
10 conductive type that is the same as the epitaxial conductive
11 type.
